

Amendments to the Claims:

This listing of claims will replace all prior versions,
and listings, of claims in the application:

Listing of Claims:

1 Claim 1 (Currently amended): A method of
2 manufacturing a cylinder head for a small engine
3 comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 ~~aperture blind opening communicating with one end of said~~
7 ~~cylinder chamber~~, cooling fins, an exhaust port extending
8 from the cylinder chamber to a first face on an exhaust
9 ~~post port~~ flange, an intake port extending from said
10 cylinder chamber to a second face on an intake port
11 flange, fastener openings in said first and second faces,
12 a foot flange having an as-cast mounting surface at
13 ~~another~~ an end of said cylinder chamber, and having as-
14 cast fastening openings in said foot flange, wherein said
15 as-cast spark-plug ~~aperture blind opening is formed~~
16 without the use of a through core pin and the blind
17 opening is entirely closed at one end by a thin web;
18 machining said cylinder wall to a predetermined
19 tolerance;

20 removing said thin web of the blind opening to form
21 a spark plug through aperture communicating with another
22 end of the cylinder chamber ~~that closes one end of said~~
23 ~~as-cast spark plug aperture; and~~
24 tapping said spark plug through aperture.

Claim 2 (Canceled)

1 Claim 3 (Currently amended): A method of
2 manufacturing a cylinder head for a small engine
3 comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 aperture communicating with one end of said cylinder
7 chamber, cooling fins, an as-cast blind exhaust port
8 ~~extending from the cylinder chamber to a first face on an~~
9 ~~exhaust port flange, an as-cast blind~~ intake port
10 ~~extending from said cylinder chamber to a second face on~~
11 ~~an intake port flange, fastener openings in said a first~~
12 ~~and second faces~~ face on an exhaust port flange,
13 additional fastener openings in a second face on an
14 intake port flange, a foot flange having an as-cast
15 mounting surface at another end of said cylinder chamber,
16 and having as-cast fastening openings in said foot
17 flange, wherein ~~said exhaust port aperture and said~~

18 ~~intake aperture are closed by thin webs forming portions~~
19 ~~of said as-cast cylinder chambers~~ the as-cast blind
20 exhaust port is formed without the use of a through core
21 pin and the as-cast blind exhaust port is entirely closed
22 at one end by a first thin web comprising a portion of
23 the cylinder wall, the as-cast blind intake port is
24 formed without the use of a through core pin and the as-
25 cast blind intake port is entirely closed at one end by a
26 second thin web comprising another portion of the
27 cylinder wall;

28 machining said cylinder wall to a predetermined
29 tolerance, wherein the first web of the blind exhaust
30 port and the second web of the blind intake port are
31 removed by the step of machining the cylinder wall to
32 form a through exhaust port extending from the cylinder
33 chamber to the first face on the exhaust port flange and
34 a through intake port extending from the cylinder chamber
35 to the second face on the intake port flange;

36 ~~removing said thin webs when said cylinder wall is~~
37 ~~machined;~~ and

38 tapping said spark plug aperture.

1 Claim 4 (Original): A method of manufacturing a
2 cylinder head according to claim 1, wherein the

3 flatness of the as-cast mounting surface of said foot
4 flange is 0.006 inch over its entire surface.

1 Claim 5 (Original): A method of manufacturing a
2 cylinder head according to claim 1, wherein said as-cast
3 fastening openings in said foot flange are cast to a
4 perpendicularity of 0.002 inch with respect to the foot
5 flange mounting surface.

1 Claim 6 (Original): A method of manufacturing a
2 cylinder head according to claim 1, wherein said as-cast
3 fastening openings in said foot flange are cast to
4 within 0.006 inch of a true positional location on said
5 foot flange.

1 Claim 7 (Currently amended): A method of
2 manufacturing a cylinder head for a small engine
3 comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 ~~aperture blind opening communicating with one end of said~~
7 ~~cylinder chamber~~, cooling fins, an exhaust port extending
8 from the cylinder chamber to a first face on an exhaust
9 ~~post port~~ flange, an intake port extending from said
10 cylinder chamber to a second face on an intake port

11 flange, fastener openings in said first and second faces,
12 a foot flange having an as-cast mounting surface at
13 ~~another~~ an end of said cylinder chamber, and having as-
14 cast fastening openings in said foot flange, said as-cast
15 fastening openings in said foot flange being cast
16 within 0.006 inch of a true positional location on said
17 foot flange and being cast to a perpendicularity of 0.002
18 inch with respect to the foot flange mounting surface,
19 said as-cast mounting surface of said foot flange
20 being 0.006 inch over its entire surface, wherein said
21 as-cast spark-plug ~~aperture~~ blind opening is formed
22 without the use of a through core pin and the blind
23 opening is entirely closed at one end by a thin web;
24 boring said cylinder wall to a predetermined
25 tolerance;
26 removing said thin web ~~that closes one end of said~~
27 ~~as-cast spark-plug aperture~~ of the blind opening to form
28 a spark plug through aperture communicating with another
29 end of the cylinder chamber; and
30 tapping said spark plug through aperture.

Claim 8 (Canceled)

1 Claim 9 (Currently amended): A method of
2 manufacturing a cylinder head for a small engine
3 comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 aperture communicating with one end of said cylinder
7 chamber, cooling fins, an as-cast blind exhaust port
8 ~~extending from the cylinder chamber to a first face on an~~
9 ~~exhaust port flange, an as-cast blind~~ intake port
10 ~~extending from said cylinder chamber to a second face on~~
11 ~~an intake port flange, fastener openings in said a first~~
12 ~~and second faces~~ face on an exhaust port flange,
13 additional fastener openings in a second face on an
14 intake port flange, a foot flange having an as-cast
15 mounting surface at another end of said cylinder chamber,
16 and having as-cast fastening openings in said foot
17 flange, said as-cast fastening openings in said foot
18 flange being cast within 0.006 inch of a true positional
19 location on said foot flange and being cast to a
20 perpendicularity of 0.002 inch with respect to the foot
21 flange mounting surface, said as-cast mounting surface of
22 said foot flange being 0.006 inch over its entire
23 surface; wherein ~~said exhaust port aperture and said~~
24 ~~intake aperture are closed by thin webs forming portions~~
25 ~~of said as-cast cylinder chambers~~ the as-cast blind

26 exhaust port is formed without the use of a through core
27 pin and the as-cast blind exhaust port is entirely closed
28 at one end by a first thin web comprising a portion of
29 the cylinder wall, the as-cast blind intake port is
30 formed without the use of a through core pin and the as-
31 cast blind intake port is entirely closed at one end by a
32 second thin web comprising another portion of the
33 cylinder wall;

34 boring said cylinder wall to a predetermined
35 tolerance, wherein the first web of the blind exhaust
36 port and the second web of the blind intake port are
37 removed by the step of boring the cylinder wall to form a
38 through exhaust port extending from the cylinder chamber
39 to the first face on the exhaust port flange and a
40 through intake port extending from the cylinder chamber
41 to the second face on the intake port flange;

42 ~~removing said thin webs when said cylinder wall~~
43 ~~is machined; and~~

44 tapping said spark plug aperture.

1 Claim 10 (Currently amended): A method of
2 manufacturing a cylinder head according to claim 1,
3 wherein apertures are cast in said fins, each of said fin
4 apertures being are axially aligned with a corresponding

5 one of the fastening ~~apertures~~ openings in said foot
6 flange.

1 Claim 11 (Currently amended): A method of
2 manufacturing a cylinder head according to claim 1,
3 wherein apertures are machined in said fins, each of said
4 fin apertures ~~being~~ are axially aligned with a
5 corresponding one of the fastening ~~apertures~~ openings in
6 said foot flange.

Claims 12-16 (Canceled)

1 Claim 17 (Withdrawn): A method of manufacturing a
2 crankcase for a small engine comprising the steps of
3 casting a crankcase having a crankcase chamber, first and
4 second bearing recess at an end of said crankcase
5 chamber, each recess being defined by a cylindrical
6 sidewall having a plurality of rounded radially inwardly
7 directed flutes formed thereon, and pressing a roller
8 bearing into each recess.

1 Claim 18 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 17, wherein the flutes are
3 evenly spaced about the cylindrical sidewalls and are
4 separated by arcuate sidewall portions.

1 Claim 19 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 18, wherein the flutes in
3 said first bearing recess are offset an arcuate distance
4 with respect to the flutes in said second bearing recess.

1 Claim 20 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 19, wherein said arcuate
3 distance corresponds to said arcuate dimension.

1 Claim 21 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 20, wherein the number of
3 balls in said ball bearing do not equal the number of
4 flutes in a bearing recess.

1 Claim 22 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 20, wherein the number of
3 balls in said ball bearing are greater than the number of
4 flutes in a bearing recess.

1 Claim 23 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 20, wherein there are
3 eight balls in a ball bearing and seven flutes in a
4 bearing recess.

1 Claim 24 (Withdrawn): A method of manufacturing a
2 crankcase according to claim 17, wherein each roller
3 bearing is pressed into each recess until it seats on
4 said toroidal base.

1 Claim 25 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly for a small
3 engine comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 ~~aperture blind opening communicating with one end of said~~
7 ~~cylinder chamber~~, cooling fins, an exhaust port extending
8 from the cylinder chamber to a first face on an exhaust
9 ~~post port~~ flange, an intake port extending from said
10 cylinder chamber to a second face on an intake port
11 flange, fastener openings in said first and second faces,
12 a foot flange having an as-cast mounting surface at
13 another end of said cylinder chamber, and having as-cast
14 fastening openings in said foot flange, wherein said as-
15 cast spark-plug ~~aperture blind opening~~ is formed without
16 the use of a through core pin and the blind opening is
17 entirely closed at one end by a thin web;
18 machining said cylinder wall to a predetermined
19 tolerance;

20 removing said thin web ~~that closes one end of said~~
21 ~~as-cast spark-plug aperture~~ of the blind opening to form
22 a spark plug through aperture communicating with one end
23 of the cylinder chamber;
24 tapping said spark plug through aperture;
25 casting a crankcase having a crank chamber, a
26 crankcase connecting flange defining an opening to said
27 crank chamber, said crankcase connecting flange having an
28 as-cast flange mounting surface, and having first and
29 second fastener openings cast into said [[as-cast]]
30 crankcase flange mounting surface;
31 positioning the as-cast mounting surface of said
32 cylinder head foot flange in face-to-face contact with
33 the as-cast flange mounting surface of said crankcase so
34 that the as-cast fastening openings in the cylinder head
35 foot flange are in axial alignment with the first and
36 second fastener openings of said crankcase flange
37 mounting surface; and
38 fastening said cylinder head to said crankcase by
39 threading said openings and apertures with self-threading
40 fasteners.

Claim 26 (Canceled)

1 Claim 27 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly for a small
3 engine comprising the steps of
4 casting a cylinder head having an as-cast cylinder
5 chamber defined by a cylinder wall, an as-cast spark plug
6 aperture communicating with one end of said cylinder
7 chamber, cooling fins, an as-cast blind exhaust port
8 ~~extending from the cylinder chamber to a first face on an~~
9 ~~exhaust port flange,~~ an as-cast blind intake port
10 ~~extending from said cylinder chamber to a second face on~~
11 ~~an intake port flange,~~ fastener openings in said a first
12 face on an exhaust port flange, additional fastener
13 openings in a second face on an intake port flange and
14 ~~second faces,~~ a foot flange having an as-cast mounting
15 surface at another end of said cylinder chamber, and
16 having as-cast fastening openings in said foot flange,
17 wherein ~~said exhaust port aperture and said intake~~
18 ~~aperture are closed by thin webs forming portions of said~~
19 ~~as-cast cylinder chambers~~ the as-cast blind exhaust port
20 is formed without the use of a through core pin and the
21 as-cast blind exhaust port is entirely closed at one end
22 by a first thin web comprising a portion of the cylinder
23 wall, the as-cast blind intake port is formed without the
24 use of a through core pin and the as-cast blind intake

25 port is entirely closed at one end by a second thin web
26 comprising another portion of the cylinder wall;

27 machining said cylinder wall to a predetermined
28 tolerance, wherein the first web of the blind exhaust
29 port and the second web of the blind intake port are
30 removed by the step of machining the cylinder wall to
31 form a through exhaust port extending from the cylinder
32 chamber to the first face on the exhaust port flange and
33 a through intake port extending from the cylinder chamber
34 to the second face on the intake port flange;

35 ~~removing said thin webs when said cylinder wall is~~
36 ~~machined;~~

37 tapping said spark plug aperture;

38 casting a crankcase having a crank chamber, a
39 crankcase connecting flange defining an opening to said
40 crank chamber, said crankcase connecting flange having an
41 as-cast flange mounting surface, and having first and
42 second fastener openings cast into said [[as-cast]]
43 crankcase flange mounting surface;

44 positioning the as-cast mounting surface of said
45 cylinder head foot flange in face-to-face contact with
46 the as-cast flange mounting surface of said crankcase so
47 that the as-cast fastening openings in the cylinder head
48 foot flange are in axial alignment with the first and

49 second fastener openings of said crankcase flange
50 mounting surface; and
51 fastening said cylinder head to said crankcase by
52 threading said openings and apertures with self-threading
53 fasteners.

54 Claim 28 (Currently amended): A method of
55 manufacturing ~~a cylinder head~~ an assembly according to
56 claim 25, wherein the flatness of the as-cast mounting
57 surface of said foot flange is 0.006 inch over its entire
58 surface.

1 Claim 29 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly according to
3 claim 25, wherein said as-cast fastening openings in said
4 foot flange are cast to a perpendicularity of 0.002 inch
5 with respect to the foot flange mounting surface.

1 Claim 30 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly according to
3 claim 25, wherein said as-cast fastening openings in said
4 foot flange are cast to within 0.006 inch of a true
5 positional location on said foot flange.

1 Claim 31 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly according to
3 claim 25, wherein apertures are cast in said fins, each
4 of said fin apertures ~~being~~ are axially aligned with a
5 corresponding one of the fastening ~~apertures~~ openings in
6 said foot flange.

1 Claim 32 (Currently amended): A method of
2 manufacturing ~~a cylinder head~~ an assembly according to
3 claim 25, wherein apertures are machined in said fins,
4 each of said fin apertures ~~being~~ are axially aligned with
5 a corresponding one of the fastening ~~apertures~~ openings
6 in said foot flange.

1 Claim 33 (Currently amended): A method of
2 manufacturing ~~a crankcase~~ an assembly according to
3 claim 25, wherein the flatness of the [[as-cast]]
4 crankcase flange mounting surface is 0.006 inch over its
5 entire surface.

6 Claim 34 (Currently amended): A method of
7 manufacturing ~~a crankcase~~ an assembly according to
8 claim 25, wherein said first and second fastener openings
9 are cast into said crankcase flange mounting surface to a

10 perpendicularity of 0.002 inch with respect to said
11 crankcase flange mounting surface.

1 Claim 35 (Currently amended): A method of
2 manufacturing ~~a crankcase~~ an assembly according to
3 claim 25, wherein said first and second fastener openings
4 are cast to within 0.006 inch of a true positional
5 location on said crankcase flange mounting surface.

1 Claim 36 (Currently amended): A method of
2 manufacturing ~~a crankcase~~ an assembly according to
3 claim 25, wherein an O-ring groove is cast into said
4 crankcase flange mounting surface to surround said
5 opening defined by said crankcase connecting flange, and
6 wherein an O-ring is inserted into said groove.